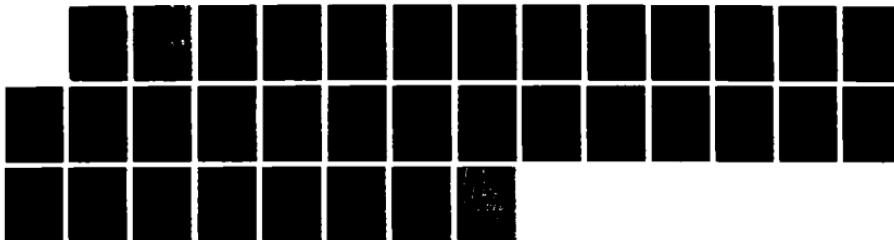
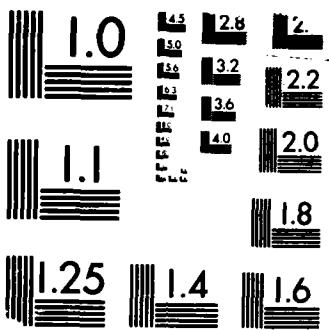


RD-A193 618 ADA (TRADE NAME) COMPILER VALIDATION SUMMARY REPORT: 1/1  
MERIDIAN SOFTWARE SY. (U) INFORMATION SYSTEMS AND  
TECHNOLOGY CENTER W-P AFB OH ADA VALI.. 10 JUN 87  
UNCLASSIFIED AVF-VSR-194. 0887 F/G 12/5 NL





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## INFORMATION PAGE

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19. KEYWORDS (Continue on reverse side if necessary and identify by block number)  <b>Ada Programming language, Ada Compiler Validation Summary Report, Ada Compiler Validation Capability, ACVC, Validation Testing, Ada Validation Office, AVO, Ada Validation Facility, AVF, ANSI/MIL-STD-1815A, Ada Joint Program Office, AJPO</b>		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  <b>See Attached.</b>		

## EXECUTIVE SUMMARY

This Validation Summary Report (VSR) summarizes the results and conclusions of validation testing performed on the Meridian AdaVantage, Version 2.0, using Version 1.8 of the Ada<sup>®</sup> Compiler Validation Capability (ACVC). The Meridian AdaVantage is hosted on an Zenith Z-248 operating under DOS 3.1. Programs processed by this compiler may be executed on an Zenith Z-248 operating under DOS 3.1.

On-site testing was performed from 7 June 1987 through 10 June 1987 at Laguna Hills, CA, under the direction of the Ada Validation Facility (AVF), according to Ada Validation Organization (AVO) policies and procedures. The AVF identified 2210 of the 2399 tests in ACVC Version 1.8 to be processed during on-site testing of the compiler. The 19 tests withdrawn at the time of validation testing, as well as the 170 executable tests that make use of floating-point precision exceeding that supported by the implementation, were not processed. After the 2210 tests were processed, results for Class A, C, D, and E tests were examined for correct execution. Compilation listings for Class B tests were analyzed for correct diagnosis of syntax and semantic errors. Compilation and link results of Class L tests were analyzed for correct detection of errors. There were 51 of the processed tests determined to be inapplicable. The remaining 2159 tests were passed.

The results of validation are summarized in the following table:

RESULT	CHAPTER												TOTAL
	2	3	4	5	6	7	8	9	10	11	12	14	
Passed	102	250	334	243	159	97	135	261	113	32	217	216	2159
Failed	0	0	0	0	0	0	0	0	0	0	0	0	0
Inapplicable	14	75	86	4	2	0	4	1	17	0	1	17	221
Withdrawn	0	5	5	0	0	1	1	2	4	0	1	0	19
TOTAL	116	330	425	247	161	98	140	264	134	32	219	233	2399

The AVF concludes that these results demonstrate acceptable conformity to ANSI/MIL-STD-1815A Ada.

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AVF Control Number: AVF-VSR-104.0887  
87-03-31-MSS

Ada<sup>®</sup> COMPILER  
VALIDATION SUMMARY REPORT:  
Meridian Software Systems, Inc.  
Meridian AdaVantage, Version 2.0  
Zenith Z-248

Completion of On-Site Testing:  
10 June 1987

Prepared By:  
Ada Validation Facility  
ASD/SCOL  
Wright-Patterson AFB OH 45433-6503

Prepared For:  
Ada Joint Program Office  
United States Department of Defense  
Washington, D.C.

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(Ada Joint Program Office).



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Ada<sup>®</sup> Compiler Validation Summary Report:

Compiler Name: Meridian AdaVantage, Version 2.0

Host:

Zenith Z-248, under  
DOS 3.1

Target:

Zenith Z-248, under  
DOS 3.1

Testing Completed 10 June 1987 Using ACVC 1.8

This report has been reviewed and is approved.

Steve Wilson

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Washington DC

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Failed	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inapplicable	14	75	86	4	2	0	4	1	17	0	1	17	221	
Withdrawn	0	5	5	0	0	1	1	2	4	0	1	0	19	
TOTAL	116	330	425	247	161	98	140	264	134	32	219	233	2399	

The AVF concludes that these results demonstrate acceptable conformity to ANSI/MIL-STD-1815A Ada.

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## CHAPTER 1

### INTRODUCTION

This Validation Summary Report (VSR) describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A. This report explains all technical terms used within it and thoroughly reports the results of testing this compiler using the Ada Compiler Validation Capability (ACVC). An Ada compiler must be implemented according to the Ada Standard, and any implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be implemented that is not in the Standard.

Even though all validated Ada compilers conform to the Ada Standard, it must be understood that some differences do exist between implementations. The Ada Standard permits some implementation dependencies--for example, the maximum length of identifiers or the maximum values of integer types. Other differences between compilers result from characteristics of particular operating systems, hardware, or implementation strategies. All of the dependencies observed during the process of testing this compiler are given in this report.

The information in this report is derived from the test results produced during validation testing. The validation process includes submitting a suite of standardized tests, the ACVC, as inputs to an Ada compiler and evaluating the results. The purpose of validating is to ensure conformity of the compiler to the Ada Standard by testing that the compiler properly implements legal language constructs and that it identifies and rejects illegal language constructs. The testing also identifies behavior that is implementation dependent but permitted by the Ada Standard. Six classes of tests are used. These tests are designed to perform checks at compile time, at link time, and during execution.

## INTRODUCTION

### 1.1 PURPOSE OF THIS VALIDATION SUMMARY REPORT

This VSR documents the results of the validation testing performed on an Ada compiler. Testing was carried out for the following purposes:

- To attempt to identify any language constructs supported by the compiler that do not conform to the Ada Standard
- To attempt to identify any unsupported language constructs required by the Ada Standard
- To determine that the implementation-dependent behavior is allowed by the Ada Standard

Testing of this compiler was conducted by SofTech, Inc., under the direction of the AVF according to policies and procedures established by the Ada Validation Organization (AVO). On-site testing was conducted from 7 June 1987 through 10 June 1987 at Laguna Hills, CA.

### 1.2 USE OF THIS VALIDATION SUMMARY REPORT

Consistent with the national laws of the originating country, the AVO may make full and free public disclosure of this report. In the United States, this is provided in accordance with the "Freedom of Information Act" (5 U.S.C. #552). The results of this validation apply only to the computers, operating systems, and compiler versions identified in this report.

The organizations represented on the signature page of this report do not represent or warrant that all statements set forth in this report are accurate and complete, or that the subject compiler has no nonconformities to the Ada Standard other than those presented. Copies of this report are available to the public from:

Ada Information Clearinghouse  
Ada Joint Program Office  
OUSDRE  
The Pentagon, Rm 3D-139 (Fern Street)  
Washington DC 20301-3081

or from:

Ada Validation Facility  
ASD/SCOL  
Wright-Patterson AFB OH 45433-6503

## INTRODUCTION

Questions regarding this report or the validation test results should be directed to the AVF listed above or to:

Ada Validation Organization  
Institute for Defense Analyses  
1801 North Beauregard Street  
Alexandria VA 22311

### 1.3 REFERENCES

1. Reference Manual for the Ada Programming Language, ANSI/MIL-STD-1815A, February 1983.
2. Ada Validation Organization: Procedures and Guidelines, Ada Joint Program Office, 1 January 1987.
3. Ada Compiler Validation Capability Implementers' Guide, SofTech, Inc., December 1984.

### 1.4 DEFINITION OF TERMS

ACVC	The Ada Compiler Validation Capability. A set of programs that evaluates the conformity of a compiler to the Ada language specification, ANSI/MIL-STD-1815A.
Ada Standard	ANSI/MIL-STD-1815A, February 1983.
Applicant	The agency requesting validation.
AVF	The Ada Validation Facility. In the context of this report, the AVF is responsible for conducting compiler validations according to established policies and procedures.
AVO	The Ada Validation Organization. In the context of this report, the AVO is responsible for setting procedures for compiler validations.
Compiler	A processor for the Ada language. In the context of this report, a compiler is any language processor, including cross-compilers, translators, and interpreters.
Failed test	A test for which the compiler generates a result that demonstrates nonconformity to the Ada Standard.
Host	The computer on which the compiler resides.

## INTRODUCTION

Inapplicable test	A test that uses features of the language that a compiler is not required to support or may legitimately support in a way other than the one expected by the test.
Passed test	A test for which a compiler generates the expected result.
Target	The computer for which a compiler generates code.
Test	A program that checks a compiler's conformity regarding a particular feature or features to the Ada Standard. In the context of this report, the term is used to designate a single test, which may comprise one or more files.
Withdrawn test	A test found to be incorrect and not used to check conformity to the Ada language specification. A test may be incorrect because it has an invalid test objective, fails to meet its test objective, or contains illegal or erroneous use of the language.

### 1.5 ACVC TEST CLASSES

Conformity to the Ada Standard is measured using the ACVC. The ACVC contains both legal and illegal Ada programs structured into six test classes: A, B, C, D, E, and L. The first letter of a test name identifies the class to which it belongs. Class A, C, D, and E tests are executable, and special program units are used to report their results during execution. Class B tests are expected to produce compilation errors. Class L tests are expected to produce link errors.

Class A tests check that legal Ada programs can be successfully compiled and executed. However, no checks are performed during execution to see if the test objective has been met. For example, a Class A test checks that reserved words of another language (other than those already reserved in the Ada language) are not treated as reserved words by an Ada compiler. A Class A test is passed if no errors are detected at compile time and the program executes to produce a PASSED message.

Class B tests check that a compiler detects illegal language usage. Class B tests are not executable. Each test in this class is compiled and the resulting compilation listing is examined to verify that every syntax or semantic error in the test is detected. A Class B test is passed if every illegal construct that it contains is detected by the compiler.

Class C tests check that legal Ada programs can be correctly compiled and executed. Each Class C test is self-checking and produces a PASSED, FAILED, or NOT APPLICABLE message indicating the result when it is executed.

Class D tests check the compilation and execution capacities of a compiler. Since there are no capacity requirements placed on a compiler by the Ada Standard for some parameters--for example, the number of identifiers

## INTRODUCTION

permitted in a compilation or the number of units in a library--a compiler may refuse to compile a Class D test and still be a conforming compiler. Therefore, if a Class D test fails to compile because the capacity of the compiler is exceeded, the test is classified as inapplicable. If a Class D test compiles successfully, it is self-checking and produces a PASSED or FAILED message during execution.

Each Class E test is self-checking and produces a NOT APPLICABLE, PASSED, or FAILED message when it is compiled and executed. However, the Ada Standard permits an implementation to reject programs containing some features addressed by Class E tests during compilation. Therefore, a Class E test is passed by a compiler if it is compiled successfully and executes to produce a PASSED message, or if it is rejected by the compiler for an allowable reason.

Class L tests check that incomplete or illegal Ada programs involving multiple, separately compiled units are detected and not allowed to execute. Class L tests are compiled separately and execution is attempted. A Class L test passes if it is rejected at link time--that is, an attempt to execute the main program must generate an error message before any declarations in the main program or any units referenced by the main program are elaborated.

Two library units, the package REPORT and the procedure CHECK\_FILE, support the self-checking features of the executable tests. The package REPORT provides the mechanism by which executable tests report PASSED, FAILED, or NOT APPLICABLE results. It also provides a set of identity functions used to defeat some compiler optimizations allowed by the Ada Standard that would circumvent a test objective. The procedure CHECK\_FILE is used to check the contents of text files written by some of the Class C tests for chapter 14 of the Ada Standard. The operation of these units is checked by a set of executable tests. These tests produce messages that are examined to verify that the units are operating correctly. If these units are not operating correctly, then the validation is not attempted.

The text of the tests in the ACVC follow conventions that are intended to ensure that the tests are reasonably portable without modification. For example, the tests make use of only the basic set of 55 characters, contain lines with a maximum length of 72 characters, use small numeric values, and place features that may not be supported by all implementations in separate tests. However, some tests contain values that require the test to be customized according to implementation-specific values--for example, an illegal file name. A list of the values used for this validation is provided in Appendix C.

A compiler must correctly process each of the tests in the suite and demonstrate conformity to the Ada Standard by either meeting the pass criteria given for the test or by showing that the test is inapplicable to the implementation. The applicability of a test to an implementation is considered each time the implementation is validated. A test that is inapplicable for one validation is not necessarily inapplicable for a subsequent validation.

## INTRODUCTION

Any test that was determined to contain an illegal language construct or an erroneous language construct is withdrawn from the ACVC and, therefore, is not used in testing a compiler. The tests withdrawn at the time of validation are given in Appendix D.

## CHAPTER 2

### CONFIGURATION INFORMATION

#### 2.1 CONFIGURATION TESTED

The candidate compilation system for this validation was tested under the following configuration:

Compiler: Meridian AdaVantage, Version 2.0

ACVC Version: 1.8

Certificate Number: 870608W1.08079

#### Host Computer:

Machine: Zenith Z-248

Operating System: DOS 3.1

Memory Size: 640 Kilobytes

#### Target Computer:

Machine: Zenith Z-248

Operating System: DOS 3.1

Memory Size: 640 Kilobytes

## CONFIGURATION INFORMATION

### 2.2 IMPLEMENTATION CHARACTERISTICS

One of the purposes of validating compilers is to determine the behavior of a compiler in those areas of the Ada Standard that permit implementations to differ. Class D and E tests specifically check for such implementation differences. However, tests in other classes also characterize an implementation. This compiler is characterized by the following interpretations of the Ada Standard:

- Capacities.

The compiler correctly processes tests containing loop statements nested to 65 levels, block statements nested to 65 levels, and recursive procedures separately compiled as subunits nested to 6 levels. It correctly processes a compilation containing 723 variables in the same declarative part. (See tests D55A03A..H (8 tests), D56001B, D64005E..G (3 tests), and D29002K.)

- Universal integer calculations.

An implementation is allowed to reject universal integer calculations having values that exceed SYSTEM.MAX\_INT. This implementation does not reject such calculations and processes them correctly. (See tests D4A002A, D4A002B, D4A004A, and D4A004B.)

- Predefined types.

This implementation supports the additional predefined type LONG\_INTEGER in the package STANDARD. (See test B86001C.)

- Based literals.

An implementation is allowed to reject a based literal with a value exceeding SYSTEM.MAX\_INT during compilation, or it may raise NUMERIC\_ERROR or CONSTRAINT\_ERROR during execution. This implementation raises NUMERIC\_ERROR during execution. (See test E24101A.)

- Array types.

An implementation is allowed to raise NUMERIC\_ERROR or CONSTRAINT\_ERROR for an array having a 'LENGTH that exceeds STANDARD.INTEGER'LAST and/or SYSTEM.MAX\_INT.

A packed BOOLEAN array having a 'LENGTH exceeding INTEGER'LAST raises NUMERIC\_ERROR when the array objects are declared. (See test C52103X.)

## CONFIGURATION INFORMATION

A packed two-dimensional BOOLEAN array with more than INTEGER'LAST components raises NUMERIC\_ERROR when the array objects are declared. (See test C52104Y.)

A null array with one dimension of length greater than INTEGER'LAST may raise NUMERIC\_ERROR or CONSTRAINT\_ERROR either when declared or assigned. Alternatively, an implementation may accept the declaration. However, lengths must match in array slice assignments. This implementation raises NUMERIC\_ERROR when the array type is declared. (See test E52103Y.)

In assigning one-dimensional array types, the expression appears to be evaluated in its entirety before CONSTRAINT\_ERROR is raised when checking whether the expression's subtype is compatible with the target's subtype. In assigning two-dimensional array types, the expression does not appear to be evaluated in its entirety before CONSTRAINT\_ERROR is raised when checking whether the expression's subtype is compatible with the target's subtype. (See test C52013A.)

- **Discriminated types.**

During compilation, an implementation is allowed to either accept or reject an incomplete type with discriminants that is used in an access type definition with a compatible discriminant constraint. This implementation accepts such subtype indications. (See test E38104A.)

In assigning record types with discriminants, the expression appears to be evaluated in its entirety before CONSTRAINT\_ERROR is raised when checking whether the expression's subtype is compatible with the target's subtype. (See test C52013A.)

- **Aggregates.**

In the evaluation of a multi-dimensional aggregate, all choices appear to be evaluated before checking against the index type. (See tests C43207A and C43207B.)

In the evaluation of an aggregate containing subaggregates, all choices are not evaluated before being checked for identical bounds. (See test E43212B.)

All choices are not evaluated before CONSTRAINT\_ERROR is raised if a bound in a nonnull range of a nonnull aggregate does not belong to an index subtype. (See test E43211B.)

## CONFIGURATION INFORMATION

- Functions.

An implementation may allow the declaration of a parameterless function and an enumeration literal having the same profile in the same immediate scope, or it may reject the function declaration. If it accepts the function declaration, the use of the enumeration literal's identifier denotes the function. This implementation rejects the declaration. (See test E66001D.)

- Representation clauses.

The Ada Standard does not require an implementation to support representation clauses. If a representation clause is not supported, then the implementation must reject it. While the operation of representation clauses is not checked by Version 1.8 of the ACVC, they are used in testing other language features. This implementation accepts 'SMALL clauses for fixed point types; it rejects 'SIZE clauses, 'STORAGE\_SIZE clauses for collections, and enumeration representation clauses. (See tests C55B16A, C87B62A, C87B62B, C87B62C, and BC1002A.)

- Pragmas.

The pragma INLINE is not supported for procedures or for functions. (See tests CA3004E and CA3004F.)

- Input/output.

The package SEQUENTIAL\_IO cannot be instantiated with unconstrained array types and record types with discriminants. The package DIRECT\_IO cannot be instantiated with unconstrained array types and record types with discriminants without defaults. (See tests AE2101C, AE2101H, CE2201D, CE2201E, and CE2401D.)

An existing text file cannot be opened in OUT\_FILE mode, can be created in OUT\_FILE mode, and can be created in IN\_FILE mode. (See test EE3102C.)

More than one internal file can be associated with each external file for text I/O for reading only. (See tests CE3111A..E (5 tests).)

More than one internal file can be associated with each external file for sequential I/O for reading only. (See tests CE2107A..F (6 tests).)

More than one internal file can be associated with each external file for direct I/O for reading only. (See tests CE2107A..F (6 tests).)

## CONFIGURATION INFORMATION

Temporary sequential files are given names. Temporary direct files are given names. Temporary files given names are deleted when they are closed. (See tests CE2108A and CE2108C.)

### • Generics.

A generic subprogram body cannot be compiled as a subunit in a separate compilation from its declaration. (See test CA2009F.)

A generic package body cannot be compiled as a subunit in a separate compilation from its specification. (See tests CA2009C and BC3205D.)

A generic package or subprogram body must be in the same compilation file as its specification; the error is not reported until the unit is named in a WITH clause or the body is compiled. (See tests BC3205D and LA5008A..C (3 tests).)

## CHAPTER 3

### TEST INFORMATION

#### 3.1 TEST RESULTS

Version 1.8 of the ACVC contains 2399 tests. When validation testing of the Meridian AdaVantage was performed, 19 tests had been withdrawn. The remaining 2380 tests were potentially applicable to this validation. The AVF determined that 221 tests were inapplicable to this implementation, and that the 2159 applicable tests were passed by the implementation.

The AVF concludes that the testing results demonstrate acceptable conformity to the Ada Standard.

#### 3.2 SUMMARY OF TEST RESULTS BY CLASS

RESULT	TEST CLASS						TOTAL
	A	B	C	D	E	L	
Passed	67	863	1167	15	11	36	2159
Failed	0	0	0	0	0	0	0
Inapplicable	2	4	201	2	2	10	221
Withdrawn	0	7	12	0	0	0	19
TOTAL	69	874	1380	17	13	46	2399

## TEST INFORMATION

### 3.3 SUMMARY OF TEST RESULTS BY CHAPTER

RESULT	CHAPTER													TOTAL
	2	3	4	5	6	7	8	9	10	11	12	14		
Passed	102	250	334	243	159	97	135	261	113	32	217	216	2159	
Failed	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inapplicable	14	75	86	4	2	0	4	1	17	0	1	17	221	
Withdrawn	0	5	5	0	0	1	1	2	4	0	1	0	19	
TOTAL	116	330	425	247	161	98	140	264	134	32	219	233	2399	

### 3.4 WITHDRAWN TESTS

The following 19 tests were withdrawn from ACVC Version 1.8 at the time of this validation:

C32114A	C41404A	B74101B
B33203C	B45116A	C87B50A
C34018A	C48008A	C92005A
C35904A	B49006A	C940ACA
B37401A	B4A010C	CA3005A..D (4 tests)
		BC3204C

See Appendix D for the reason that each of these tests was withdrawn.

### 3.5 INAPPLICABLE TESTS

Some tests do not apply to all compilers because they make use of features that a compiler is not required by the Ada Standard to support. Others may depend on the result of another test that is either inapplicable or withdrawn. The applicability of a test to an implementation is considered each time a validation is attempted. A test that is inapplicable for one validation is not necessarily inapplicable for a subsequent attempt. For this validation attempt, 221 tests were inapplicable for the reasons indicated:

- C34001D, B52004E, B55B09D, and C55B07B use SHORT\_INTEGER which is not supported by this compiler.
- C34001F and C35702A use SHORT\_FLOAT which is not supported by this compiler.

## TEST INFORMATION

- C34001G and C35702B use LONG\_FLOAT which is not supported by this compiler.
- C55B16A uses an enumeration representation clause which is not supported by this implementation.
- D64005E and D64005F require more levels of nested recursive procedures than the memory can support. The exception STORAGE\_ERROR is raised by the execution of these tests.
- B86001D requires a predefined numeric type other than those defined by the Ada language in package STANDARD. There is no such type for this implementation.
- C86001F redefines package SYSTEM, but TEXT\_IO is made obsolete by this new definition in this implementation and the test cannot be executed since the package REPORT is dependent on the package TEXT\_IO.
- C87B62A uses a 'SIZE representation clause which is not supported by this compiler. The clause is rejected during compilation.
- C87B62B uses a 'STORAGE\_SIZE clause for an access type, which is not supported by this compiler. The clause is rejected during compilation.
- C96005B checks implementations for which the smallest and largest values in type DURATION are different from the smallest and largest values in DURATION's base type. This is not the case for this implementation.
- CA2009C, CA2009F, LA5008D, LA5008E, LA5008F, LA5008M, and LA5008N compile generic bodies as subunits in separate compilation files. Separate compilation of generic specifications and subunit bodies is not supported by this compiler.
- CA3004E, EA3004C, and LA3004A use the INLINE pragma for procedures which is not supported by this compiler.
- CA3004F, EA3004B, and LA3004B use the INLINE pragma for functions which is not supported by this compiler.
- CA1012A, LA5008A, LA5008B, LA5008C, and BC3205D compile generic specifications and bodies in separate compilations. This implementation requires that generic specifications and bodies be compiled in the same file; the error is not reported until the generic unit is named in a WITH clause or the body is compiled.
- AE2101C, CE2201D, and CE2201E use instantiations of package SEQUENTIAL\_IO with unconstrained types which is not supported by this compiler.

## TEST INFORMATION

- AE2101H and CE2401D use instantiations of package DIRECT\_IO with unconstrained types which is not supported by this compiler.
- CE2107B..E (4 tests), CE2110B, CE2111D, CE2111H, CE3111B..E (4 tests), and CE3114B are inapplicable because multiple internal files cannot be associated with the same external file when one is opened or created with mode OUT\_FILE. The proper exception is raised when multiple access is attempted.
- The following 170 tests require a floating-point accuracy that exceeds the maximum of 15 supported by the implementation:

C24113L..Y (14 tests)  
C35705L..Y (14 tests)  
C35706L..Y (14 tests)  
C35707L..Y (14 tests)  
C35708L..Y (14 tests)  
C35802L..Y (14 tests)  
C45241L..Y (14 tests)  
C45321L..Y (14 tests)  
C45421L..Y (14 tests)  
C45424L..Y (14 tests)  
C45521L..Z (15 tests)  
C45621L..Z (15 tests)

### 3.6 SPLIT TESTS

If one or more errors do not appear to have been detected in a Class B test because of compiler error recovery, then the test is split into a set of smaller tests that contain the undetected errors. These splits are then compiled and examined. The splitting process continues until all errors are detected by the compiler or until there is exactly one error per split. Any Class A, Class C, or Class E test that cannot be compiled and executed because of its size is split into a set of smaller subtests that can be processed.

Splits were required for four Class B tests:

B22003A

B59001A

B85013C

B97101E

### 3.7 ADDITIONAL TESTING INFORMATION

#### 3.7.1 Prevalidation

Prior to validation, a set of test results for ACVC Version 1.8 produced by the Meridian AdaVantage was submitted to the AVF by the applicant for review. Analysis of these results demonstrated that the compiler successfully passed all applicable tests, and that the compiler exhibited

the expected behavior on all inapplicable tests.

### 3.7.2 Test Method

Testing of the Meridian AdaVantage using ACVC Version 1.8 was conducted on-site by a validation team from the AVF. The configuration consisted of a Zenith Z-248 operating under DOS 3.1.

A set of diskettes containing all tests except for withdrawn tests and tests requiring unsupported floating-point precisions was taken on-site by the validation team for processing. Tests that make use of implementation-specific values were customized before being written to the diskettes; tests requiring splits during the prevalidation testing were included in their split form on the diskettes.

The contents of the diskettes were loaded directly onto the host computer. After the test files were loaded, the full set of tests was compiled on the Zenith Z-248 and all executable tests were linked and run. The results were transferred via KERMIT to a Zilog System 8000, recorded on magnetic tape, read onto a second Zilog System 8000, and printed from that machine.

The compiler was tested using command scripts provided by Meridian Software Systems, Inc. and reviewed by the validation team. The following option was in effect for testing:

<u>Option</u>	<u>Effect</u>
-w	Suppress warning messages

Tests were compiled, linked, and executed (as appropriate) using a single host computer. Test output, compilation listings, and job logs were captured on magnetic tape and archived at the AVF. The listings examined on-site by the validation team were also archived.

### 3.7.3 Test Site

The validation team arrived at Laguna Hills, CA on 7 June 1987, and departed after testing was completed on 10 June 1987.

**APPENDIX A**  
**DECLARATION OF CONFORMANCE**

Meridian Software Systems, Inc. has submitted the  
following declaration of conformance concerning the  
Meridian AdaVantage compiler.

## DECLARATION OF CONFORMANCE

Compiler Implementor: Meridian Software Systems, Inc.  
Ada<sup>®</sup> Validation Facility: ASD/SCOL, Wright-Patterson AFB, OH  
Ada Compiler Validation Capability (ACVC) Version: 1.8

### Base Configuration

Base Compiler Name: Meridian AdaVantage	Version: Version 2.0
Host Architecture ISA: Zenith Z-248	OS&VER #: DOS 3.1
Target Architecture ISA: Zenith Z-248	OS&VER #: DOS 3.1

### Implementor's Declaration

I, the undersigned, representing Meridian Software Systems, Inc. have implemented no deliberate extensions to the Ada Language Standard ANSI/MIL-STD-1815A in the compiler listed in this declaration. I declare that Meridian Software Systems, Inc. is the owner of record of the Ada language compiler listed above and, as such, is responsible for maintaining said compiler in conformance to ANSI/MIL-STD-1815A. All certificates and registrations for the Ada language compiler listed in this declaration shall be made only in the owner's corporate name.

S. B. Whitehill  
Meridian Software Systems, Inc.  
Stephen B. Whitehill, Vice President

Date: 6/10/87

### Owner's Declaration

I, the undersigned, representing Meridian Software Systems, Inc. take full responsibility for implementation and maintenance of the Ada compiler listed above, and agree to the public disclosure of the final Validation Summary Report. I further agree to continue to comply with the Ada trademark policy, as defined by the Ada Joint Program Office. I declare that the Ada language compiler listed and its host/target performance are in compliance with the Ada Language Standard ANSI/MIL-STD-1815A. I have reviewed the Validation Summary Report for the compiler and concur with the contents.

S. B. Whitehill  
Meridian Software Systems, Inc.  
Stephen B. Whitehill, Vice President

Date: 6/10/87

<sup>®</sup>Ada is a registered trademark of the United States Government (Ada Joint Program Office).

## APPENDIX B

### APPENDIX F OF THE Ada STANDARD

The only allowed implementation dependencies correspond to implementation-dependent pragmas, to certain machine-dependent conventions as mentioned in chapter 13 of MIL-STD-1815A, and to certain allowed restrictions on representation clauses. The implementation-dependent characteristics of the Meridian AdaVantage, Version 2.0, are described in the following sections which discuss topics in Appendix F of the Ada Language Reference Manual (ANSI/MIL-STD-1815A). Implementation-specific portions of the package STANDARD are also included in this appendix.

```
package STANDARD is

    ...

    type INTEGER is range -32768 .. 32767;
    type LONG_INTEGER is range -2_147_483_648 .. 2_147_483_647;

    type FLOAT is digits 15
        range -1.797_693_134_862_31E+308 .. 1.797_693_134_862_31E+308;

    type DURATION is delta 0.0001 range -86_400.0000 .. 86_400.0000;

    ...

end STANDARD;
```

## APPENDIX F OF THE Ada STANDARD

### 1. Pragmas

There are no implementation-defined pragmas. The predefined pragmas ELABORATE, INTERFACE, PRIORITY, and SUPPRESS are implemented; pragma PACK is implemented for record types, causing enumeration and discrete range components to be compressed to the smallest number of bits appropriate to those types. The ON parameter to pragma SUPPRESS is ignored; the pragma applies to all types within its scope. The other predefined pragmas are recognized but ignored.

### 2. Implementation-Dependent Attributes

No implementation-dependent attributes are defined.

### 3. Package SYSTEM

The following declarations appear in the package SYSTEM:

```
subtype ADDRESS is LONG_INTEGER;  
  
type NAME is (i8086);  
  
SYSTEM_NAME : constant NAME := i8086;  
  
STORAGE_UNIT : constant := 8;  
MEMORY_SIZE : constant := 1_048_576;  
  
MIN_INT      : constant := -2_147_483_648;  
MAX_INT      : constant := 2_147_483_647;  
MAX_DIGITS   : constant := 15;  
MAX_MANTISSA : constant := 31;  
FINE_DELTA    : constant := 2.0 ** (-30);  
TICK         : constant := 1.0 / 18.2;  
  
subtype PRIORITY is INTEGER range 1 .. 20;
```

### 4. Representation Clause Restrictions

The only representation clauses supported are 'STORAGE\_SIZE for task types, record representation clauses, and 'SMALL clauses for fixed point types.

### 5. Address Clauses

Address clauses are supported. Values of type SYSTEM.ADDRESS are 32-bit integers whose high-order 16 bits are the paragraph address (shifted right four bits) and whose low-order 16 bits are the offset.

## APPENDIX F OF THE Ada STANDARD

### 6. Unchecked Conversions

The only restriction on the use of `unchecked_conversions` is that they may not be used to convert between a scalar object and a composite object. Note that conversions between objects whose sizes do not conform may result in storage areas with undefined values.

### 7. Input-Output Packages

The number of user-defined files which may be open simultaneously is restricted to 17, including `STANDARD_INPUT`, `STANDARD_OUTPUT`. File input/output is buffered, except for files associated with terminal devices. In calls to `OPEN` and `CREATE`, the `FORM` parameter must be the empty string (the default value). The exception `USE_ERROR` is raised by a call to `OPEN` or `CREATE` with a non-empty string as the value of the `FORM` parameter, by an attempt to change the mode of a file from `IN_FILE` to any other mode, by an attempt to `RESET` a text file which has mode `OUT_FILE` (unless the call to `RESET` specifies mode `IN_FILE`), and by an attempt to open a text or sequential file with mode `OUT_FILE`.

## APPENDIX C

### TEST PARAMETERS

Certain tests in the ACVC make use of implementation-dependent values, such as the maximum length of an input line and invalid file names. A test that makes use of such values is identified by the extension .TST in its file name. Actual values to be substituted are represented by names that begin with a dollar sign. A value must be substituted for each of these names before the test is run. The values used for this validation are given below.

<u>Name and Meaning</u>	<u>Value</u>
\$BIG_ID1 Identifier the size of the maximum input line length with varying last character.	(1..199 => 'A', 200 => '1')
\$BIG_ID2 Identifier the size of the maximum input line length with varying last character.	(1..199 => 'A', 200 => '2')
\$BIG_ID3 Identifier the size of the maximum input line length with varying middle character.	(1..99 => 'A', 100 => '3', 101..200 => 'A')
\$BIG_ID4 Identifier the size of the maximum input line length with varying middle character.	(1..99 => 'A', 100 => '4', 101..200 => 'A')
\$BIG_INT_LIT An integer literal of value 298 with enough leading zeroes so that it is the size of the maximum line length.	(1..197 => '0', 198..200 => "298")

## TEST PARAMETERS

Name and Meaning	Value
\$BIG_REAL_LIT A real literal that can be either of floating- or fixed-point type, has value 690.0, and has enough leading zeroes to be the size of the maximum line length.	(1..194 => '0', 195..200 => "69.0E1")
\$BLANKS A sequence of blanks twenty characters fewer than the size of the maximum line length.	(1..180 => ' ')
\$COUNT_LAST A universal integer literal whose value is TEXT_IO.COUNT'LAST.	32766
\$EXTENDED_ASCII_CHARS A string literal containing all the ASCII characters with printable graphics that are not in the basic 55 Ada character set.	"abcdefghijklmnopqrstuvwxyz" & "!\$%?@[\]^{}~"
\$FIELD_LAST A universal integer literal whose value is TEXT_IO.FIELD'LAST.	32767
\$FILE_NAME_WITH_BAD_CHARS An illegal external file name. (There are no illegal characters in file names, so a non-existent directory is specified.)	\a\b\c\d\e\f\g\h1
\$FILE_NAME_WITH_WILD_CARD_CHAR An illegal external file name. (No wild-card characters would be illegal in a file name, so a non-existent directory is named.)	\a\b\c\d\e\f\g\h2
\$GREATER_THAN_DURATION A universal real value that lies between DURATION'BASE'LAST and DURATION'LAST if any, otherwise any value in the range of DURATION.	86_400.0

TEST PARAMETERS

Name and Meaning	Value
\$GREATER_THAN_DURATION_BASE_LAST The universal real value that is greater than DURATION'BASE'LAST, if such a value exists.	10_000_000.0
\$ILLEGAL_EXTERNAL_FILE_NAME1 An illegal external file name.	\a\b\c\d\c\f\g\h3
\$ILLEGAL_EXTERNAL_FILE_NAME2 An illegal external file name that is different from \$ILLEGAL_EXTERNAL_FILE_NAME1.	\a\b\c\d\c\f\g\h4
\$INTEGER_FIRST The universal integer literal expression whose value is INTEGER'FIRST.	-32768
\$INTEGER_LAST The universal integer literal expression whose value is INTEGER'LAST.	32767
\$LESS_THAN_DURATION A universal real value that lies between DURATION'BASE'FIRST and DURATION'FIRST if any, otherwise any value in the range of DURATION.	-86_400.0
\$LESS_THAN_DURATION_BASE_FIRST The universal real value that is less than DURATION'BASE'FIRST, if such a value exists.	-10_000_000.0
\$MAX_DIGITS The universal integer literal whose value is the maximum digits supported for floating-point types.	15
\$MAX_IN_LEN The universal integer literal whose value is the maximum input line length permitted by the implementation.	200
\$MAX_INT The universal integer literal whose value is SYSTEM.MAX_INT.	2147483647

## TEST PARAMETERS

<u>Name and Meaning</u>	<u>Value</u>
\$NAME A name of a predefined numeric type other than FLOAT, INTEGER, SHORT_FLOAT, SHORT_INTEGER, LONG_FLOAT, or LONG_INTEGER if one exists, otherwise any undefined name.	NO_SUCH_TYPE_SO_NOT_APPLICABLE
\$NEG_BASED_INT A based integer literal whose highest order nonzero bit falls in the sign bit position of the representation for SYSTEM.MAX_INT.	16#FFFFFFFE#
\$NON_ASCII_CHAR_TYPE An enumerated type definition for a character type whose literals are the identifier NON_NULL and all non-ASCII characters with printable graphics.	(NON_NULL)

## APPENDIX D

### WITHDRAWN TESTS

Some tests are withdrawn from the ACVC because they do not conform to the Ada Standard. The following 19 tests had been withdrawn at the time of validation testing for the reasons indicated. A reference of the form "AI-ddddd" is to an Ada Commentary.

- C32114A: An unterminated string literal occurs at line 62.
- B33203C: The reserved word "IS" is misspelled at line 45.
- C34018A: The call of function G at line 114 is ambiguous in the presence of implicit conversions.
- C35904A: The elaboration of subtype declarations SFX3 and SFX4 may raise NUMERIC\_ERROR instead of CONSTRAINT\_ERROR as expected in the test.
- B37401A: The object declarations at lines 126 through 135 follow subprogram bodies declared in the same declarative part.
- C41404A: The values of 'LAST and 'LENGTH are incorrect in the if statements from line 74 to the end of the test.
- B45116A: ARRPRIBL1 and ARRPRIBL2 are initialized with a value of the wrong type--PRIBOOL\_TYPE instead of ARRPRIBOOL\_TYPE--at line 41.
- C48008A: The assumption that evaluation of default initial values occurs when an exception is raised by an allocator is incorrect according to AI-00397.
- B49006A: Object declarations at lines 41 and 50 are terminated incorrectly with colons, and end case; is missing from line 42.
- B4A010C: The object declaration in line 18 follows a subprogram body of the same declarative part.

## WITHDRAWN TESTS

- B74101B: The begin at line 9 causes a declarative part to be treated as a sequence of statements.
- C87B50A: The call of "/=" at line 31 requires a use clause for package A.
- C92005A: The "/=" for type PACK.BIG\_INT at line 40 is not visible without a use clause for the package PACK.
- C940ACA: The assumption that allocated task TT1 will run prior to the main program, and thus assign SPYNUMB the value checked for by the main program, is erroneous.
- CA3005A..D (4 tests): No valid elaboration order exists for these tests.
- BC3204C: The body of BC3204C0 is missing.

END

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